

The Role of the Leader in the Process of Overcoming Communication Barriers in the New Era of Industry 4.0

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Abstract— Modern challenges in the new era of Industry 4.0 confront leaders with communication barriers. Barriers are factors that block or negatively change successful communication in teams. They cause stress, which is the result of dynamically developing technologies and advanced automation of processes. Depending on the leader, barriers can be temporary and surmountable, but they can be permanent and more difficult to overcome. The proposed key factors of a leader are closely related to leadership skills in the process of overcoming communication barriers. Taking into account the specific characteristics of the industry and the growing role of the leader in the process of making management decisions, an algorithm is proposed for successfully overcoming communication barriers in the new era of Industry 4.0. The purpose of the report is to analyze the barriers and systematize the key factors for successful communication in the team and the role of the leader in developing Fig. 1. A model of an algorithm for successfully overcoming communication barriers..

Keywords— *Communication Barriers, Role of the Leader, Industry 4.0, model of an algorithm for successfully overcoming communication barriers*

I. INTRODUCTION

The dynamic changes brought about by technological transformation, digitalization, and automation of production processes lead to shifts in communication methods, which in turn create a growing need for clear communication within teams. The leader's communication plays a crucial role in uniting the team around shared visions and achievable goals.

Communication is the procedure of encoding an purpose into a notification, which is then transmitted through communication channels and decoded by the

recipient [1]. A key aspect of managerial communication is the ability to persuade others to act.

In the new era of Industry 4.0, with the increasing influence of artificial intelligence, leaders face challenges related to overcoming new communication barriers in the management process. Communication is one of the essential tools for leaders in managing teams. Interpersonal communication is at the heart of any team's success, but existing barriers related to factors beyond the leaders' control can lead to both positive and negative consequences within the team [2].

The development of Industry 4.0, driven by new technological advancements such as the implementation of information and communication technologies in the production process—e.g., artificial intelligence, digital systems for process monitoring and control, network communications, and large-scale data collection and processing—has necessitated a review of existing communication barriers within teams.

The paper used a qualitative research methodology based on an extensive literature review and critical analysis to explore the key role of leadership in successfully overcoming communication barriers in Industry 4.0.

II. MATERIALS AND METHODS

The study refers to a research methodology based on an extensive review of contemporary literature and critical analysis to systematize the communication barriers and key leadership skills to overcome them in the context of Industry 4.0. Key sources of data include journal publications, research studies, and websites focusing on

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communication processes, technological developments, and the role of contemporary leadership in the new era of Industry 4.0.

The research process includes systematization and identification of communication barriers, challenges faced by contemporary leaders related to successful overcoming of barriers. The analytical key categories included the nature and types of organizational barriers, the need to improve the skills of the contemporary leader aimed at sustainable industry development.

Personal interview methods were applied with leaders who substantiated the practical issues in the process of interpersonal and cultural communication in teams. Conceptual insights were supported by theoretical frameworks to practical examples and models of management decision making.

This methodological approach helped to develop a theoretical algometric model for successfully overcoming communication barriers in the new era of Industry 4.0.

III. RESULTS AND DISCUSSION

Communication barriers are factors that block or significantly alter successful communication. The results of a critical review of the current literature show that about 20% of communication problems that cause problems in Industry 4.0 can be overcome. Awareness and recognition are of paramount importance in the process of overcoming barriers. Successfully overcoming communication barriers leads to an improved organizational environment and optimized work processes in today's reality.

However, organizational readiness to identify significant barriers and successfully overcome them depends entirely on the leadership decisions of leaders. Their role and key skills are the basis for the successful development of any organization in Industry 4.0.

1. *Communication barriers in the team*

Communication barriers within teams create obstacles in receiving and understanding the messages used by others to convey specific information, ideas, and thoughts. The causes of communication breakdown and the creation of barriers within teams are rooted in individuals' differing attitudes, values, and expectations, which stem from various perceptions, authority, and life status within the team. Barriers are factors that negatively affect successful communication within the team.

Research shows that 20% of these influences can be avoided or successfully resolved by the leader [3]. After conducting analyses, the barriers that affect effective communication in the team in the new era of Industry 4.0 were identified.

A. *Personal Barriers.*

Personal barriers. A key issue that creates barriers in teams is the informal authority assumed by a team member

or the mentorship provided by another person within the team. Status differences related to power and organizational hierarchy, especially in manager-employee relationships, are also a precondition for establishing barriers.

On the other hand, the absence of hierarchy in power differences does not guarantee effective communication. New information technologies offer an alternative way to overcome barriers related to status differences by establishing non-hierarchical work relationships [4].

Interpersonal communication within the team is essential for quality and work relationships in the organization. Leaders who demonstrate empathy and respond to interpersonal communication with employees foster trust and loyal relationships within the team. It turns out that leaders who are direct, dictatorial, and arrogant with employees create barriers, which leads to team unproductivity. Encouraging feedback improves interpersonal communication within the team and prevents barriers [5]. A lack of sincere communication within the team is defined as a barrier that leads to social isolation and inefficiency.

B. *Behavioral Barriers.*

Behavioral barriers. Behavior related to biases and stereotypes also leads to communication barriers. Appearance and behavior contribute to different stereotypical views among people. Stereotypes arise from various assumptions made by employees within the team [6]. Views are based on bias initiated by specific behavior, appearance, or particular possessions. These barriers lead to communication breakdowns. Leaders must treat every team member equally. Rules and fairness should guide the formation of organizational relationships within the team. Therefore, regardless of viewpoints, appearance, and personality differences among team members, the leader must appreciate all behavioral differences and personality traits of the employees.

C. *Cultural Values.*

Cultural values and behavior patterns can be confusing communication barriers within the team. People worldwide differ, and these diverse types of cultural stereotypes can be confusing and misleading in intercultural communication. Differences are provoked by international values that influence motivation, leadership, and teamwork in work relationships. Once again, it is the leader's responsibility to establish, refine, and unify the use of specific words in the communication process and clarify their use within the team.

D. *Language Barriers*

Language is a key component of communication. Language barriers arise when employees speak different languages or the level of proficiency is different in the relevant language. Barriers also occur when employees

speak the same language but use jargon that is incomprehensible to other team members.

E. Gender Differences.

Communication barriers resulting from gender differences are explained by variations in conversational styles. Men and women have different communication styles. Research shows that women prefer face-to-face communication, as it facilitates direct understanding. It is proven that women provide limited information to team members [7]. In such cases, the leader's role is to clarify the information between parties, rather than allowing free interpretation of the meaning from one's perspective.

2. A leader's key role for overcoming communication barriers in industry 4.0

According to Peter Drucker, leadership is the act of pushing human imagination toward higher horizons, elevating the quality of work to higher standards, and developing the human personality beyond its normal limits [8]. There are various definitions of leadership, but one of the most interesting comes from Harry Truman, who described leadership as the ability to get others to do something they don't want to do and make them like it. Regardless of the different definitions, many authors agree that thanks to leadership, people achieve more than they would without a leader, they follow the leader voluntarily, and their efforts are directed toward achieving specific goals.

Leaders in the new era of Industry 4.0 have access to more communication tools than ever before. New technologies lead to restructuring teams and workplaces, which can either encourage or discourage ethical communication. The key factors for overcoming communication barriers in the context of digital transformation in Industry 4.0 have been systematized. As it becomes evident, the leader is at the core of the successful management of any team. As technology advances, the role of communication within the team and its surrounding environment becomes increasingly prominent [9].

A. Clear, Specific, and Systematic Communication.

The leader's role in the team is paramount to effective communication with employees and all stakeholders. According to other authors communication is key to effective crisis management [10]. Leaders must be able to provide clear, specific, and systematic communication to employees, keeping them informed about the organization's state while motivating them and maintaining their motivation.

Leaders must communicate clearly and effectively with the team and other stakeholders. They should be ready to listen to employees' opinions and experiences to make the most effective decisions for the organization and

overcome all barriers faced by the Industry 4.0 team [11]. Establishing open and transparent communication with employees and all interested parties reduces uncertainty and builds trust and commitment. Various communication means may be used, including social media, emails, video conferences, and others. It is important to choose the appropriate communication method that is relevant to the needs of team members.

Clear and specific communication. In modern reality of Industry 4.0, leaders must be able to communicate clearly and specifically. They must provide the team with accurate information about the company's condition, as well as the measures that will be taken in a crisis and how it will be overcome [12]. Leaders must be able to answer team members' questions and inform them about the steps taken to resolve the issue.

B. Creating Two-Way Communication.

Creating two-way communication. Leaders' roles should focus on establishing effective two-way communication that allows employees to share their opinions and recommendations. This will help identify problems and generate new ideas. The ability to communicate effectively is important for leaders not only during a crisis but also during the normal functioning of the organization. Leaders should frequently communicate with their team members, informing them about the organization's goals, strategies, and achievements [13]. This will improve the communication culture in the organization and increase employee engagement and motivation

C. Adaptability and Speed.

Adaptability and speed in communication. In the new era of Industry 4.0, change is constant and unpredictable. Leaders must be receptive, adaptable, and swift in delivering the necessary information to the team. This includes encouraging innovation, experimentation, and continuous improvement, where employees feel empowered to take risks and adapt their approach in response to changing conditions [14].

D. Promoting Team Collaboration.

In the process of promoting team collaboration, the leader's role is to guide the team toward cooperation and communication among employees, remove barriers, and encourage the sharing of information and knowledge exchange [15]. By fostering collaboration among employees, leaders successfully guide teams in overcoming barriers in the rapidly changing environment of the new era of Industry 4.0.

E. Resilience and Persistence.

Resilience and persistence are essential to the leader's role in the new era of Industry 4.0, where challenges are inevitable. Through open communication, leaders must ensure their teams' resilience by providing

support, resources, and guidance to help employees cope effectively with stress and uncertainty [16].

F. Balancing Professional and Personal Life.

The leader's role in successfully overcoming barriers is related to creating a balance between the professional and personal life of team members. The leader must provide access to resources and time to encourage employees to take breaks for recharging. Creating a favorable work environment where employees feel comfortable sharing and seeking help when needed leads to successfully overcoming various barriers.

G. Building Collaboration and Communication Channels.

Establishing strategic communication channels with partners and stakeholders leads to increased team trust in the leader and successful goal achievement. Collaboration and communication channels are the key to success in the new era of Industry 4.0. Leaders should build strategic partnerships and relationships with other organizations, stakeholders, and communities to ensure rapid and secure communication during crises [17].

The role of the leader and communication with key partners, suppliers, customers, and stakeholders leads to the creation of sustainable communication channels and the achievement of mutual cooperation [18]. By working together toward common and shared goals, organizations can deal more effectively with uncertainty and create value for everyone involved.

H. Encouraging the team towards continuous improvement.

The leader must encourage the team to continuously improve and learn. Continuous learning in the process of digitalization is essential for the successful development of the team in Industry 4.0, where knowledge and skills become obsolete at an ever-faster pace. Leaders should encourage their team members to pursue lifelong learning and professional development, motivating employees to expand their knowledge, acquire new skills, and adapt to changing technologies and trends [19].

I. Clear, specific, and strategic communication.

Guided by strategic goals and values. In times of uncertainty and ambiguity, the role of the leader is to guide the team through a clear purpose and values, ensuring effective communication, a specific direction, and clarity amid chaos. Leaders must clarify the compelling vision and mission to inspire and motivate employees.

J. Unified communication system.

The leader must create conditions for unified virtual communication and provide technological support to team members. Creating a unified communication system offers employees in the team ample opportunities to tackle challenges.

K. Personal example.

For successful communication, the personal example of the leader is of paramount importance. Demonstrating integrity, empathy, and resilience encourages a team culture of trust, transparency, and ethical behavior, where employees feel valued, respected, and empowered to give their best at work. Openness and honesty towards all employees play a key role in the process of effective communication. In modern conditions, the leader should focus on communication with honesty, clarity, humanity, and responsibility.

L. Technological progress.

With the advancement of technologies, interaction between team members is interrupted. Technological advancements have completely changed how the team interacts. In today's reality, it is possible to communicate with people worldwide online, through text, email, video, or mobile apps, so we may be more connected than ever before with our peers. With the development of artificial intelligence and the presence of robots, the leader's role is increasingly important, and human emotionality is a competitive advantage within the team [20].

The role of leaders is not only to communicate clearly and inspiringly but also to possess emotional intelligence, communicate with care, honesty, and empathy with each team member, and build trust. These unique human qualities of empathy, vulnerability, and authenticity are irreplaceable powerful drivers of influence and inspiration. Team leaders must build communication precision and trust, inspire the team, and attract more followers [21].

Now more than ever, leaders and their teams need the space to think differently so that decisions are based on a range of diverse, critically oriented perspectives. The leader's role is also recognized in encouraging thoughts, opinions, and ideas from the team. Encouraging talent at all levels is a key factor in the new era of Industry 4.0

3. A model of an algorithm for successfully overcoming communication barriers

The analyses and derivations of barriers and key skills are a prerequisite for developing a theoretical model for successfully overcoming emerging communication barriers in the new era of Industry 4.0.

The successful implementation of a model of an algorithm for successfully overcoming communication barriers depends on multiple factors, as well as organizational readiness. The proposed model is visualized in Fig. 1 trust in AI systems and the evolving regulatory landscape. The following subsections present an in-depth discussion of these results, structured around the benefits, applications and barriers to the implementation of AI in management.

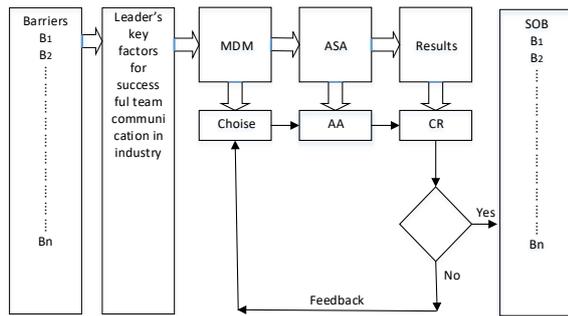


Fig. 1. A model of an algorithm for successfully overcoming communication barriers.

The algorithm is based on two blocks at the input of the algorithm, which are a synthesis of the primary information about the stages in the algorithm of the model for successfully overcoming communication barriers. The first block contains the selected barriers, and the third block identifies the key leadership skills. Based on the key skills, communication barriers that are significant for the industry are selected, after which they move on to the stage of making management decisions (MDM). The goal of the first stage is to make an informed choice (Choice) for a barrier that must be overcome as a priority.

The second stage is related to the implementation of the selected alternatives (ASA), as a result of which the specific alternative is implemented (AA).

In the third stage, the results obtained in the process of overcoming the barriers (Results) are analyzed. The main goal is to implement thorough control of the obtained results (CR).

If the barriers are successfully overcome (SOB), there is a way out of the problem situation and the communication barriers are successfully overcome.

In the process of controlling, deviations or negative results can be identified, which lead to the provision of feedback and a return to the stage of making a management decision. The process proceeds to a phased and sequential implementation of the algorithm set in the model for overcoming communication barriers.

IV. CONCLUSIONS

The role of the leader in managing and interacting with team members is a powerful form of communication but requires a new focus to meet contemporary challenges. In the communication process, the leader must create opportunities for every employee to share new ideas and opinions, thereby enhancing the team's effectiveness and success.

Overcoming barriers in the communication process is especially important to enable collaboration and coordination within the team, particularly in crisis situations. Referring to leadership abilities to communicate and lead the team, information, goals, directions, emotions, etc., are shared.

The identified barriers in the new era of Industry 4.0 can help improve communication in crisis management and support both the successful functioning of the team and the benefits for all stakeholders.

Effective leadership in the new era of Industry 4.0 requires adaptive leaders who overcome barriers and build bridges for successful communication, enabling team development amidst constant change and uncertainty. By embracing adaptability, promoting resilience and well-being, leaders promote team communication in the modern reality and stimulate organizational resilience and success. A proposed theoretical model can be applied in organizations to successfully overcome communication barriers. Referring to the challenges and opportunities in the new era of Industry 4.0, by overcoming barriers, leaders successfully guide the team towards long-term growth and prosperity in an ever-changing global economy.

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